

The Coastal Storms Initiative

What is the Coastal Storms Initiative?

The Coastal Storms Initiative (CSI) is a nationwide effort led by the National Oceanic and Atmospheric Administration (NOAA) to lessen the impacts of storms on coastal communities. To accomplish this goal, local, state, and federal organizations are working together on site-specific projects.

How Will the Coastal Storms Initiative Work?

This program's second pilot program will be getting underway in the Pacific Northwest this year. The geographic area for the pilot includes portions of the lower Columbia River, the northwest Oregon coast (to Tillamook Bay), and the southwest Washington coast (to Grays Harbor). This effort will be a compilation of projects that address specific hazards-related issues. Taken together, the projects will result in a large suite of new and improved tools, data, information, forecast models, and training for coastal communities. Proposed projects for the Pacific Northwest pilot currently under consideration include:

- Columbia River Circulation Model
- Improved Oceanographic and Meteorological Observations
- Ecological Assessment of Storm Impacts on Marine Resources
- Data Access and Standards
- Improved Prediction of Coastal Waves
- Risk and Vulnerability Assessment Tools
- Outreach and Extension

The Coastal Storms Initiative already has a successful first pilot underway in the St. Johns Watershed along Florida's northeast coast. Many of the projects undertaken for the Florida pilot are now nearing completion. A future pilot in Southern California also is being planned.

What Does This Initiative Hope to Accomplish?

Currently, more than half the population of the U.S. lives in the coastal zone. The Coastal Storms Initiative seeks to ensure the safety of this population and sustain the natural environment, which in turn will promote a healthy economy. As a result of the products and services developed for this project, local communities will better be able to predict and reduce the impacts of coastal storms, saving lives, property, and money.

For Additional Information

If you would like additional information about the NOAA Coastal Storms Initiative, please contact Keelin Kuipers at (301) 713-3155, extension 208 or via email at Keelin.Kuipers@noaa.gov.





The Coastal Storms Initiative: Columbia River Circulation Model

Real-time and Forecast River Conditions

Knowing the forecast and real-time conditions of Oregon and Washington State's Lower Columbia River would help the marine navigation community and coastal, ecosystem, fisheries, and emergency managers more effectively manage and plan their operations. As part of the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration's (NOAA) Office of Coast Survey is considering the testing and operational implementation of an experimental circulation model for the Columbia River that was originally developed and is presently run by the Oregon Graduate Institute (OGI) School of Science and Engineering of the Oregon Health and Science University. The model is part of CORIE, a pilot environmental observation and forecasting system for the Columbia River, which has had early applications to address issues combining salmon habitat and passage, hydropower management, navigation improvements, and habitat restoration.

How the Project Will Work

The hydrodynamic circulation model will provide real-time and short-term forecasts of the conditions of the river and estuary extending from the Bonneville Dam to the near-coastal Eastern North Pacific. The model will make use of real-time observations, including water level, temperature, salinity, meteorological, and river gauge data, and forecasts from coastal circulation forecast models, river forecast models, and weather forecast models.

The circulation model also effectively incorporates other components of the Coastal Storms Initiative. For example, improved oceanographic observations will enable more quality control for the model results. Results from the circulation model and comparisons with real-time data will be available to the public via a link from the Coastal Storms Initiative Web page. Graphical products will include time series and maps of water levels, currents, temperature, and salinity throughout the domain.

The experimental version of this model-based forecast system will be tested for accuracy and forecast skill against National Ocean Service (NOS) standards for water levels and currents and considered for operational implementation in NOS' Center for Operational Oceanographic Products and Services. Operational implementation means that the model products will be quality controlled and their integrity guaranteed. It will be two to three years before the Columbia River Circulation Model is formally operational.

For Additional Information

Frank Aikman
NOAA National Ocean Service
NOAA Office of Coast Survey
Telephone: (301) 713-2809, ext.101
E-mail: Frank.Aikman@noaa.gov





The Coastal Storms Initiative:

Improved Oceanographic and Meteorological Observations

Comprehensive Forecasting Data Available On-Line

Increasing coastal populations mean increasing numbers of people are at risk during coastal storms. To accurately forecast storm-related impacts and warn vulnerable populations, marine forecasters and coastal managers need real-time access to reliable, and standardized oceanographic and meteorological observations.

Currently, three existing oceanographic and meteorological networks operate in the pilot region, but these networks do not provide consistent and adequate marine forecasting data. These networks include the National Water Level Observation Network (NWLON) operated by National Oceanic and Atmospheric Administration's (NOAA) Center for Operational Oceanographic Products and Services and a local network of tide stations on the Columbia River managed by the Port of Portland. NOAA's National Data Buoy Center operates the Marine Observation Network in the pilot area and is proposing to deploy an offshore data buoy off the west coast to enhance this network. This buoy would enhance local weather forecast offices' ability to issue heavy surf advisories and coastal flood warnings, which are based primarily on observed or predicted wave height. In addition, NOAA's Environmental Technology Laboratory would install a coastal profiler system to observe coastal winds, temperature and precipitation. These organizations would work together on this project to enhance these networks for an improved environmental monitoring system for the Lower Columbia River in Oregon and Washington State. These new observations will be used to improve marine forecast products.

How the Project Will Work

To meet the project goals, the existing coastal oceanographic and meteorological observing system networks would be enhanced by installing additional sensors at existing stations and establishing new observation stations at critical areas with known data gaps. During the first year, standard sensors and systems will be procured and their installation begun, and a new offshore buoy will be deployed. Operation and maintenance of these newly configured networks would take place in year two and will become operational. Additional enhancements to the observation systems may be made in year three.

Oceanographic and meteorological observations collected via this project will also be used to calibrate and evaluate the development of the Columbia River Hydrodynamic Circulation Model (Project 1) and the High Resolution Wave Model (Project 5) and real-time data will be used to provide quality control of the model systems when they become operational.

For Additional Information

Steve Gill
NOAA National Ocean Service
Center for Operational Oceanographic Products and Services
Telephone: (301) 713-2981, ext. 139
E-mail: Stephen.Gill@noaa.gov





The Coastal Storms Initiative:

Ecological Assessment of Storm Impacts on Marine Resources

Assessing and Mitigating Ecological Effects of Contaminated Storm Runoff

Local governments need tools and information to help them plan for the ecological impacts of storm events, including the effects of human activities on coastal natural resources. This could lead to better land use practices, which will provide protection for sensitive natural resources and reduced risk for human consumers of these resources. Through the Coastal Storms Initiative, National Oceanic and Atmospheric Administration (NOAA) scientists will evaluate how coastal storms mobilize contaminants into rivers, estuaries, and nearshore ecosystems, and will assess how these contaminants affect natural resources. Recommending ways to mitigate contaminant exposure effects is the overall aim of this project.

How the Project Will Work

The project will first identify contaminant sources in the Lower Columbia River Watershed, and along the Oregon and Washington coasts from Tillamook Bay north to Grays Harbor. Next, the contaminant release potential for these sources will be determined following different types of storm events, using a combination of geographic information systems (GIS) and transport modeling. These predictions of the ranges of contaminant concentrations will then be tested in laboratory exposure scenarios for both fish and invertebrate prey species. Finally, recommendations for mitigating potential ecological effects will be incorporated into contingency

planning efforts for coastal storm response agencies. This project may also involve participating in an ongoing multi-agency study to determine the cause of high levels of pre-spawn mortality of adult coho salmon in the Pacific Northwest. These mortality events appear to be associated with urban storm water runoff. The project will likely take three to four years to complete. Information from this project will be disseminated through the Risk and Vulnerability Assessment Tools project, as well as publications and public meetings.

For Additional Information

Tracy Collier (lead)
NOAA National Marine Fisheries Service
Telephone: (206) 860-3312
E-mail: Tracy.K.Collier@noaa.gov

Tom Siewicki
NOAA National Ocean Service
National Centers for Coastal
Ocean Science
Telephone: (843) 762-8534
E-mail: Tom.Siewicki@noaa.gov

George Graettinger
NOAA National Ocean Service
Office of Response and Restoration
Telephone: (206) 526-4660
E-mail: George.Graettinger@noaa.gov





The Coastal Storms Initiative: Improved Prediction of Coastal Waves

New Weather Models to Enhance Forecasts and Warnings

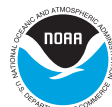
Recreational and professional mariners need wave forecasts that are more accurate than those currently available. Through the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service will produce accurate and detailed marine forecasts of coastal waves. A computer model will examine the pilot project area in Oregon and Washington State and will produce high-resolution wave guidance for National Weather Service forecasters to use in the preparation of marine forecasts and warnings. Users and other interested parties will be able to access these forecasts in a graphic format through the National Weather Service via the Internet.

How the Project Will Work

NOAA is working with scientists from the Naval Research Laboratory and the Army Corps of Engineers to develop a high-resolution model to forecast wave heights near the shoreline. Wave models currently being used by the National Weather Service do not forecast waves in these nearshore areas. The prototype of this new model is already producing 48-hour forecasts for the Pacific Northwest and northeast Florida. This project first got underway through the Coastal Storms Initiative- Florida Pilot. This model will meet the critical need for more accurate guidance for wave heights in dangerous areas, such as bars. The Columbia River bar is one of the most dangerous navigation hazards in the United States. This information will greatly enhance weather forecasts, which will in turn help save lives and property. It will also incorporate observations gathered through the Improved Oceanographic and Meteorological Observations project. If proven successful, the model will be implemented at other National Weather Service coastal weather forecast offices. This project will take an additional two to three years to complete.

For Additional Information

Jeff Savadel
NOAA National Weather Service
Telephone: (301) 713-3557, ext. 184
E-mail: Jeffrey.Savadel@noaa.gov





The Coastal Storms Initiative: Risk and Vulnerability Assessment Tool

Helping Communities Visualize Risk

Communities need to be able to identify their risks and vulnerabilities to coastal storms to create effective hazard mitigation plans and lessen storm impacts. Through the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration's (NOAA) Coastal Services Center is considering the development of user-friendly tools that will enable local communities to spatially analyze coastal storm related risks and vulnerabilities. Based on feedback from the local communities within the Pacific Northwest pilot region, the project will potentially involve the development of several tools. Initially the concept for some of the tools will be based on the risk and vulnerability assessment tool developed for Brevard and Volusia Counties, Florida, as part of the Coastal Storms Initiative – Florida Pilot.

How the Project Will Work

The development of Internet accessible spatial analysis tools for conducting risk and vulnerability assessments will enable communities to understand their risks and vulnerabilities to coastal storms without requiring users to purchase costly geographic information systems (GIS) software. The risk and vulnerability assessment tools will enhance communities' ability to develop proactive emergency response, disaster recovery, and hazard mitigation strategies. The inclusion of a risk and vulnerability assessment in a Local Hazard Mitigation Strategy is a requirement of the Disaster Mitigation Act of 2000, executed by the Federal Emergency Management Agency.

The project also will involve coordinating the efforts of several offices to improve information retrieval, visualization, and interpretation for real-time and long-term decision making related to coastal storms and their impacts on the coastal zone. The

NOAA Coastal Services Center will work with the Oregon Ocean-Coastal Management Program (OCMP), in partnership with the Oregon Climate Service (OCS) and Oregon Department of Geology and Mineral Industries (DOGAMI) to create a special climate and coastal hazards module within the Oregon Coastal Atlas, an Internet portal to an extensive collection of information about the Oregon coastline. Collaborative efforts will assimilate historic and real-time oceanographic and climate data into an interactive mapping and information module to project the impact of ocean storms on the coastal environment. The data will be used to develop tools within the Atlas that will enable a wide range of users to understand the impacts of both long-term climate and episodic meteorological events. Its most valuable use may be to emergency managers and first responders who need to know where to allocate limited resources during storm events. During the development of this module, further investigations will be conducted to determine if similar tools can be developed for the Washington portion of the Pacific Northwest pilot region.

The risk and vulnerability assessment tools will be developed through a community involvement process to ensure the usability of the tools. The NOAA Coastal Services Center will work closely with state and local officials within the Pacific Northwest pilot region to develop a local committee to steer the development of the tools.

For Additional Information

Russell Jackson
NOAA National Ocean Service
NOAA Coastal Services Center
Telephone: (843) 740-1188
E-mail: Russell.Jackson@noaa.gov





The Coastal Storms Initiative: Outreach and Extension

The Human Component in Helping Communities

While technology and information are becoming increasingly vital to most coastal resource management efforts, the human component of community issues and solutions cannot be overlooked. To be truly useful, the products and services of the initiative need to be understood and used by the people in the region.

An important part of the Coastal Storms Initiative is the outreach and extension project, which will be spearheaded by the National Oceanic and Atmospheric Administration's (NOAA) Coastal Services Center. This project will provide training and assistance that is necessary to help the different local partners take full advantage of the tools and information being developed.

Reaching out to constituents in Oregon and Washington while the initiative is under development and throughout the life of the pilot project is another responsibility for the outreach and extension effort. By working to engage end users in the Coastal Storms Initiative, the NOAA Coastal Services Center, in partnership with Oregon and Washington Sea Grant Extension, is helping to ensure the ultimate success of this effort.

How the Project Will Work

Through Oregon and Washington Sea Grant Extension, this project has provided a regional pilot coordinator, Pat Corcoran, who will be conducting constituent meetings, developing an outreach and extension network, and identifying any needed training and technical assistance. Specifically, this

project will aid other Coastal Storms Initiative projects by planning meetings, engaging the community, and providing project leads with community feedback. Taken together, these activities will help broaden the partners' understanding of local coastal issues while expanding partnerships and facilitating implementation of other Coastal Storms Initiative projects.

NOAA's Office of Response and Restoration (OR&R) will be involved in some training and technical assistance activities through this project. These include conducting hazardous materials planning workshops. These workshops will identify the locations and types of facilities that store or use materials that could be hazardous to human health if released during an accident or coastal storms. These workshops will result in updated hazardous material response plans for the pilot area. OR&R also will develop digital Environmental Sensitivity Index (ESI) Atlases for the Columbia River. ESI Atlases show the locations of environmental resources that are particularly vulnerable to damage during a spill. The current ESI Atlases for the Columbia River are outdated and not in paper format. These ESI Atlases will result in better decisions with regard to public health and natural resources in the case of a spill during a storm event. Constituents will be involved in the review of this product.

For Additional Information

Keelin Kuipers
NOAA National Ocean Service
NOAA Coastal Services Center
Telephone: (301) 713-3155, ext. 208
E-mail: Keelin.Kuipers@noaa.gov





The Coastal Storms Initiative:

Data Access and Standards

Making Coastal Ocean and Weather Data User-Friendly and Widely Accessible

Coastal ocean and weather observations are critically important to coastal communities since these observations are needed for timely and accurate weather forecasts, developing community plans for storm preparation and response, and to mitigate effects of future events. Despite their importance, these observations are collected by a variety of organizations and are largely not available in a format useful to multiple organizations.

As part of the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration (NOAA) will increase the amount and usability of data available to forecasters and community decision makers to support accurate forecasts and response scenarios. Improved on-line access to hazards data will help coastal managers adopt well-informed and cost-effective mitigation measures. Rapid access to real-time observations, analyses, and forecasts will save time and effort during the critical period immediately before, during, and after a storm event.

How the Project Will Work

This project will build on the Data Access and Standards project currently underway in the Coastal Storms Initiative - Florida pilot. As part of the Coastal Storms Initiative, NOAA will work to identify, collect, reformat, and document coastal ocean and weather observations. This project will provide "first stop shopping" for coastal data and information, and develop a metadata catalogue to help users easily find relevant data. Existing observations will be better utilized by making them available in a timely, user-friendly, and understandable way.

For Additional Information

Judy Gray (co-lead)
NOAA Office of Oceanic and Atmospheric Research
Atlantic Oceanographic and Meteorological Laboratory
Telephone: (305) 361-4306
E-mail: Judy.Gray@noaa.gov

Russ Beard (co-lead)
NOAA National Environmental Satellite Data and Information Service
National Coastal Data Development Center
Telephone: (228) 688-3026
E-mail: Russ.Beard@noaa.gov





Coastal Storms Initiative Contact List

Pacific Northwest Pilot Project

Columbia River Circulation Model

Frank Aikman
NOAA National Ocean Service
Office of Coast Survey
Telephone: (301) 713-2809, ext. 101
E-mail: Frank.Aikman@noaa.gov

Improved Oceanographic and Meteorological Observations

Steve Gill
NOAA National Ocean Service
Center for Operational Oceanographic
Products and Services
Telephone: (301) 713-2981, ext. 139
E-mail: Stephen.Gill@noaa.gov

Data Access and Standards

Judy Gray (co-lead)
NOAA Office of Oceanic and
Atmospheric Research
Atlantic Oceanographic and
Meteorological Laboratory
Telephone: (305) 361-4306
E-mail: Judy.Gray@noaa.gov

Russ Beard (co-lead)
NOAA National Environmental Satellite
Data and Information Service
National Coastal Data Development Center
Telephone: (228) 688-3026
E-mail: Russ.Beard@noaa.gov

Ecological Assessment of Storm Impacts on Marine Resources

Tracy Collier (lead)
NOAA National Marine Fisheries Service
Telephone: (206) 860-3312
E-mail: Tracy.K.Collier@noaa.gov

Improved Prediction of Coastal Waves

Jeff Savadel
NOAA National Weather Service
Telephone: (301) 713-3557, ext. 184
E-mail: Jeffrey.Savadel@noaa.gov

Risk and Vulnerability Assessment Tools

Russell Jackson
NOAA National Ocean Service
Coastal Services Center
Telephone: (843) 740-1188
E-mail: Russell.Jackson@noaa.gov

Outreach and Extension

Keelin Kuipers
NOAA National Ocean Service
Coastal Services Center
Telephone: (301) 713-3155, ext. 208
E-mail: Keelin.Kuipers@noaa.gov

Coastal Storms Initiative Coordinator Pacific Northwest Pilot Coordinator

Keelin Kuipers
NOAA National Ocean Service
Coastal Services Center
Telephone: (301) 713-3155, ext. 208
E-mail: Keelin.Kuipers@noaa.gov

